IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of Bernard GLEICH	Atty. Docket 2003P00233WOUS
	Confirmation No. 5535
Serial No. 10/552,806	Group Art Unit: 1631
Filed: October 11, 2005	Examiner: DEJONG, Eric S.

Title: METHOD OF DETERMINING STATE VARIABLES AND CHANGES IN STATE VARIABLES

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United States Patent and Trademark Office
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APPEAL BRIEF

Sir:

Appellant herewith respectfully presents a Brief on Appeal as follows, having filed a Notice of Appeal on July 29, 2011:

REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee of record Koninklijke Philips Electronics N.V., a corporation of The Netherlands having an office and a place of business at Groenewoudseweg 1, Eindhoven, Netherlands 5621 BA.

RELATED APPEALS AND INTERFERENCES

Appellant and the undersigned attorney are not aware of any other appeals or interferences which will directly affect or be directly affected by or having a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-3, 5-17, 19 and 41-43 are pending in this application where claims 4, 18 and 20-40 are canceled. Claims 1-3, 5-17, 19 and 41-43 are rejected in the Final Office Action mailed in April 29, 2011. This rejection was upheld in an Advisory Action that mailed July 21, 2011. Claims 1-3, 5-17, 19 and 41-43 are the subject of this appeal.

STATUS OF AMENDMENTS

Appellant filed on June 29, 2011 an after final amendment in response to the Final Office Action mailed on April 29, 2011. The after final amendment included an amendment to independent claim 1 for overcoming a rejection under 35 U.S.C. §112, second paragraph. In an Advisory Action mailed on July 21, 2011, it is indicated that the after final amendment filed on June 29, 2011 will be entered, and overcomes the rejection under 35 U.S.C. §112, second paragraph, but does not place the application in condition for allowance. This Appeal Brief is in response to the Final Office Action mailed on June 29, 2011, that finally rejected claims 1-3, 5-17, 19 and 41-43, which remain finally rejected in the Advisory Action mailed on July 21, 2011.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention, for example, as recited in independent claim 1 and shown in FIG 1 and described on page 3, line 25 to page 9, line 6; and page 26, line 23 to page 27, line 31 of the specification, is directed to a method of determining physical, chemical and/or biological state variables in an examination area of an examination object by determining a change in a spatial distribution of magnetic particles in the examination area. As shown in FIG 1 and described on page 3, line 25 to page 4, line 11; page 6, line 22 to page 7, line 4, the method comprises introducing into the examination area magnetic particles in a first state or in a second state where, in the first state, at least some of the magnetic particles that are to be examined are agglomerated and/or coupled to one another and where, in the second state, the particles are deagglomerated and/or decoupled; and generating a magnetic field having a strength with a spatial profile such that there is produced in the examination area two part-areas including a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength than the low magnetic field strength. As described on page 5, line 24 to page 6, line 21; page 8, line to page 9, line 6; and page 27, lines 24-31, the method further includes changing spatial positions of the two part-areas in the examination area or changing the magnetic field strength in the first part-area to cause the change in the spatial distribution of magnetic

particles so that magnetization of the particles is locally changed; detecting signals that depend on the magnetization in the examination area that is influenced by the changing act; and evaluating the signals so as to obtain information about the change in the spatial distribution of the magnetic particles and about physical, chemical and/or biological state variables, where the physical, chemical and/or biological state variables include at least one of substance temperature, pressure, viscosity and pH; correlating the change in the spatial distribution of the magnetic particles in the examination area with at least one of a local temperature, pressure, viscosity and pH value to determine the at least one of the local substance temperature, pressure, viscosity and pH; determining the at least one of the local substance temperature, pressure, viscosity and pH; and providing an indication of the determined at least one of the local substance temperature, pressure, viscosity and pH.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-3, 5-17, 19 and 41-43 of U.S. Application Serial No. 10/552,806 is indefinite under 35 U.S.C. §112 second paragraph.

Whether claims 1-3, 5-17, 19 and 41-42 U.S. Patent Application Serial No. 10/552,806 are anticipated under 35 U.S.C. §102(b) by a publication entitled "NMR characterization of a kissing complex formed between the TAR RNA element of HIV-1 and a DNA aptamer", (Collin) in light of a publication "Biomolecular NMR Spectroscopy" (Evans) and a publication "Gradient-tailored Excitation for Single-Quantum NMR Spectroscopy of Aqueous Solutions" (Piotto).

ARGUMENT

Claims 1-3, 5-17, 19 and 41-43 are said to be indefinite under 35 U.S.C. §112 second paragraph.

As noted in the Advisory Action of July 21, 2011, this rejection of claims 1-3, 5-17, 19 and 41-43 under 35 U.S.C. §112, second paragraph is overcome by the after final amendment of June 29, 2011 which had been entered.

Claims 1-3, 5-17, 19 and 41-42 are said to be anticipated by Collin, Evans and Piotto.

Appellant respectfully requests the Board to address the patentability of independent claim 1, and further claims 2-3, 5-17, 19 and 41-42 as depending from independent claim 1, based on the requirements of independent claim 1. This position is provided for the specific and stated purpose of simplifying the current issues on appeal. However, Appellant herein specifically reserves the right to argue and address the patentability of claims 2-3, 5-17, 19 and 41-42 at a later date should the separately patentable subject matter of claims 2-3, 5-17, 19 and 41-42 later become an issue. Accordingly, this limitation of the subject matter presented for appeal herein, specifically limited to discussions of the patentability of independent claim 1 is not intended as a waiver of Appellant's right to argue

the patentability of the further claims and claim elements at that later time.

Collin is directed to performing structural analysis of an RNA-DNA complex using homo- and hetero nuclear NMR spectroscopy where triple resonance. Three axis gradient probes are used to obtain and record points and proton spectra. No details are provided about using any magnetic particles, let alone using magnetic particles in two states, namely, agglomerated deagglomerated, producing different magnetic fields in two part-areas of an examination area, changing spatial positions of the two part-areas in the examination area, or changing the magnetic field strength in the first part-area to cause the change in the spatial distribution of magnetic particles so that magnetization of the particles is locally changed for determining local substance temperature, pressure, viscosity and/or pH.

Evans describes the basic theory of NMR discussing quantized nuclear spins, NMR absorption and transition between quantized energy levels. Heteronuclear shift correlation is described to obtain H-C correlation, using two simultaneous pulses of different frequencies. Further, two approaches are described to suppress water/solvent resonance. Magnetic properties of some biologically useful nuclei are provided in Table 1.2.

Piotto is concerned with water suppression using an RF pulse and two field gradient pulses for rapid data collection and increased sensitivity to determine molecular structure. Piotto uses a particular pulse scheme shown in FIG 1, where two selective 90° RF pulses of opposite rotation and two magnetic field gradients are placed symmetrically to a non-

selective 180° RF pulse.

Collin, Evans and Piotto are not concerned with evaluating any signals and correlating data to determine any local substance temperature, pressure, viscosity and/or pH. Rather, these references are concerned with obtaining better NMR spectra and determining the structure of molecules. Further, Collin, Evans and Piotto, alone or in combination are completely silent about introducing into the examination area magnetic particles in two states, namely agglomerated deagglomerated.

It is respectfully submitted that Collin, Evans, Piotto and combination thereof, do not disclose or suggest the present invention as recited in independent claim 1 which, amongst other patentable elements, recites (illustrative emphasis provided):

> **introducing** into the examination area **magnetic particles** in a first state or in a second state wherein, in the first state, at least some of the magnetic particles that are to be examined are **agglomerated** and/or coupled to one another and wherein, in the second state, the particles are **deagglomerated** and/or decoupled;
>
> generating a magnetic field having a strength with a spatial profile such that there is produced in the examination area **two part-areas** including a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength than the low magnetic field strength;
>
> changing spatial positions of the two part-areas in the examination area or changing the magnetic field strength in the first part-area...
>
> evaluating the signals so as to obtain information about the change in the spatial distribution of the magnetic particles and about physical, chemical and/or biological state variables, wherein the physical, chemical and/or biological state variables include at least one of substance temperature, pressure, viscosity and pH;
>
> **correlating** the change in the spatial distribution of the magnetic particles **in the examination** area with at least one of a local temperature,

pressure, viscosity and pH value **to determine the at least one of the local substance temperature, pressure, viscosity and pH**;

determining the at least one of the local substance temperature, pressure, viscosity and pH; and

providing an indication of the determined at least one of the local substance temperature, pressure, viscosity and pH.

Determining local variables such as local substance temperature, pressure, viscosity and/or pH, and providing an indication thereof, by introducing into the examination area magnetic particles in two states, such as, agglomerated and deagglomerated states; generating a magnetic field of different strength in two part-areas of the examination area; changing spatial positions of the two part-areas; obtaining information about the change in the spatial distribution of the magnetic particles and **correlating** this change with the determined variables, are nowhere disclosed or suggested in Collin, Evans and Piotto, alone or in combination.

Collin, Evans, Piotto and combination thereof, do not even disclose or suggest introducing any magnetic particles in agglomerated and deagglomerated states, and are not concerned with determining local substance temperature, pressure, viscosity and/or pH. Rather, Collin describes using NMR spectroscopy for performing structural analysis of an RNA-DNA complex; Evans describes the basic theory of NMR discussing quantized nuclear spins and suppressing water/solvent resonance; and Piotto is concerned with water suppression to better determine molecular structure using NMR spectroscopy.

It is alleged on page 10, last paragraph of the Final Office Action, that page 3387,

col. 1, lines 20 and 21 of Collin "teaches the evaluation of the collected data," and that FIG 1 of Collin is "relied upon to demonstrate that the information determined from the described NMR experiments involves and is directly correlated to sample concentration and pH dependencies."

These allegations are respectfully traversed. Page 3387, col. 1, lines 20 and 21 of Collin specifically recites "[f]or the ^{1}H-^{15}N experiment across hydrogen bonds, spectral widths of 5 and 88.8 p.p.m. were used in F_2 and F_1, respectively." Such a disclosure has nothing to do with "**determining** the at least one of the local substance temperature, pressure, viscosity and pH," as recited in independent claim 1. (Illustrative emphasis provided)

Further, FIG 1 of Collin merely shows various peaks indicating presence of proton resonances. Assuming, arguendo, that somehow this provide information related to concentration, to advance prosecution and expedite allowance, claim 1 has been amended to delete concentration. FIG 1 of Collin does not even disclose or suggest anything related to temperature, pressure, viscosity and pH, let alone disclosing or suggesting "determining the at least one of the local substance temperature, pressure, viscosity and pH," as recited in independent claim 1.

In addition, assuming arguendo, that the cited prior art disclose or suggest 'use of magnetic particles in two states, namely, agglomerated and deagglomerated,' as alleged in the Advisory Action of July 21, 2011, such a disclosure does not "**correlating** the change in

the spatial distribution of the magnetic particles in the examination area with at least one of a local temperature, pressure, viscosity and pH value to determine the at least one of the local substance temperature, pressure, viscosity and pH; and **determining** the at least one of the local substance temperature, pressure, viscosity and pH," as recited in independent claim 1. (Illustrative emphasis provided)

The Board of Patent Appeals and Interferences has consistently upheld the principle that the burden of establishing a prima facie case resides with the Office, and to meet this burden, the Examiner must specifically identify where each of the claimed elements is found in the prior art:

> "there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 1576, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991). To meet [the] burden of establishing a prima facie case of anticipation, the examiner must explain how the rejected claims are anticipated by pointing out ***where all of the specific limitations recited in the rejected claims are found in the prior art*** relied upon in the rejection." *Ex Parte Naoya Isoda*, Appeal No. 2005-2289, Application 10/064,508 (BPAI Opinion October 2005).

It is respectfully submitted that the Examiner has failed to establish a prima facie case of anticipation and/or obviousness with respect to at least independent claim 1. As argued above, the cited references not only do not disclose, but also do not suggest **correlating** any particle spatial distribution change with local temperature, pressure, viscosity and/or pH, and **determining** the local substance temperature, pressure, viscosity and pH, as recited in independent claim 1.

Accordingly, it is respectfully requested that independent claim 1 be allowed. In addition, it is respectfully submitted that claims 2-3, 5-17, 19 and 41-43 should also be allowed at least based on their dependence from independent claim 1 as well as their individually patentable elements. Accordingly, separate consideration of each of the dependent claims is respectfully requested.

In addition, Appellant denies any statement, position or averment of the Examiner that is not specifically addressed by the foregoing argument and response. Any rejections and/or points of argument not addressed would appear to be moot in view of the presented remarks. However, the Appellant reserves the right to submit further arguments in support of the above stated position, should that become necessary. No arguments are waived and none of the Examiner's statements are conceded.

CONCLUSION

Claims 1-3, 5-17, 19 and 41-43 are patentable over Collin, Evans and Piotto.

Thus, the Examiner's rejections of claims 1-3, 5-17, 19 and 41-43 should be reversed.

Respectfully submitted,

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CLAIMS APPENDIX

1.(Previously Presented) A method of determining physical, chemical and/or biological state variables in an examination area of an examination object by determining a change in a spatial distribution of magnetic particles in the examination area, the method comprising the acts of:

introducing into the examination area magnetic particles in a first state or in a second state wherein, in the first state, at least some of the magnetic particles that are to be examined are agglomerated and/or coupled to one another and wherein, in the second state, the particles are deagglomerated and/or decoupled;

generating a magnetic field having a strength with a spatial profile such that there is produced in the examination area two part-areas including a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength than the low magnetic field strength;

changing spatial positions of the two part-areas in the examination area or changing the magnetic field strength in the first part-area to cause the change in the spatial distribution of magnetic particles so that magnetization of the particles is locally changed;

detecting signals that depend on the magnetization in the examination area that is influenced by the changing act;

evaluating the signals so as to obtain information about the change in the spatial distribution of the magnetic particles and about physical, chemical and/or biological state variables, wherein the physical, chemical and/or biological state variables include at least one of substance temperature, pressure, viscosity and pH;

correlating the change in the spatial distribution of the magnetic particles in the examination area with at least one of a local temperature, pressure, viscosity and pH value to determine the at least one of the local substance temperature, pressure, viscosity and pH;

determining the at least one of the local substance temperature, pressure, viscosity and pH; and

providing an indication of the determined at least one of the local substance temperature, pressure, viscosity and pH.

2.(Previously Presented) The method as claimed in claim 1, wherein the detecting act includes detecting change of the magnetic particles from the first state to the second state including deagglomeration and/or decoupling of coupled individual magnetic particles and/or detecting increased distance between individual magnetic particles.

3.(Previously Presented) The method as claimed in claim 1, wherein the detecting act includes detecting passage of the magnetic particles between the first state and the

second state, the passage being due to at least one of heat, radiation, acid, base, electrical or magnetic fields, ultrasound and/ an enzyme.

Claim 4 (Canceled)

5.(Previously Presented) The method as claimed in claim 1, further comprising the act of spatially delimiting the agglomerated magnetic particles in a medium which can be physically, chemically and/or biologically modified, dissolved and/or degraded.

6.(Previously Presented) The method as claimed in claim 5, wherein the medium comprises polysaccharides, starch, in particular dextrins or cyclodextrins, waxes, oils, fats or gels.

7.(Previously Presented) The method as claimed in claim 5, the medium comprises microorganisms.

8.(Previously Presented) The method as claimed in claim 1, further comprising the act of providing the agglomerated magnetic particles on a surface of a particulate.

9.(Previously Presented) The method as claimed in claim 1, further comprising the

act saturating the magnetic particles by application of an external magnetic field having a strength of about 100 mT or less.

10.(Previously Presented) The method as claimed in claim 1, wherein the magnetic particles comprise multidomain or monodomain particles, and further comprising the act of reversing the magnetization of the multidomain or monodomain particles by Neel's rotation and/ Brown's rotation.

11.(Previously Presented) The method as claimed in claim 1, wherein the magnetic particles are hard-magnetic or soft-magnetic multidomain particles.

12.(Previously Presented) The method as claimed in claim 1, wherein the magnetic particles are monodomain particles, or soft-magnetic multidomain particles of asymmetric shape, the method further comprising the act of reversing the magnetization of the monodomain particles by Neel's and Brown's rotation.

13.(Previously Presented) The method as claimed in claim 1, further comprising the acts of:

binding the magnetic particles to functional binding units including at least one of a functional group, a DNA sequence, an RNA sequence, and an aptamer, and ; and

introducing into the examination area at least one compound which has complementary functional binding units including at least one of a complementary functional group, a complementary DNA sequence, a complementary RNA sequence, and a complementary aptamer sequence, that interacts in a binding manner with at least one functional binding unit of the magnetic particles.

14.(Previously Presented) The method as claimed in claim 1, wherein evaluating act further comprises the acts of:

selecting of a path for the movement of the first part-area having a low magnetic field strength within the examination area,

recording of reference data by using reference samples along the path at at least one location, and in the case of at least two locations, recording external parameters using at least a first receiving coil,

at least one of interpolating and extrapolating the recorded reference data recorded in respect of points and external parameters not recorded,

measuring the path within the examination area in a sequence that is substantially identical to that used for the recording of data by the reference samples via a coil arrangement including at least one of the first receiving coil and a second receiving coil, and

comparing the measured data with the reference data by an error square

minimization to obtain compared data.

15.(Previously Presented) The method as claimed in claim 14, further comprising the act of converting the reference data to characteristics of at least a second receiving coil used for the measuring act.

16.(Previously Presented) The method as claimed in claim 14, further comprising the act of assigning the compared data obtained by the comparing act to a gray value for a pixel to give an image, with the relative pixel intensity representing a degree of the external parameters determined by at least one of the recording act and the at least one of interpolating and extrapolating acts.

17.(Previously Presented) The method as claimed in claim 16, wherein the providing act includes the act of displaying the image in a merged image.

Claim 18 (Canceled)

19.(Previously Presented) The method as claimed in claim 14, further comprising one of the acts of:

moving the first part-area having the low magnetic field strength by actuating and/or

moving the coil arrangement;

keeping stationary the first part-area having the low magnetic field strength while moving the examination object ; and

moving simultaneously both the examination object and the first part-area relative to one another.

Claims 20-40 (Canceled)

41.(Previously Presented) The method of claim 1, wherein the act of changing the magnetic field strength changes the magnetic field strength temporally in a first frequency band, and the detecting act includes detecting the signal in a second frequency band, the second frequency band including harmonics of signals in the first frequency band.

42.(Previously Presented) The method of claim 1, wherein the act of generating the magnetic field includes the act of first and second magnetic fields which change at different rates and with different amplitudes, wherein the first magnetic field changes slowly in time and with a higher amplitude relative the second magnetic field, and the second magnetic field changes rapidly in time terms and with a lower amplitude relative the first magnetic field.

43.(Previously Presented) The method of claim 1, wherein the detecting act includes detecting changes in magnetic properties of the magnetic particles due to changed distances between the magnetic particles; the method further comprising the act of producing a contrast in an image of the spatial distribution of the magnetic particles in the examination area based on the detected changes in the magnetic properties.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None